

REMARKS

I. Introduction

Claims 1 to 27 are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Rejection of Claims 1 to 19 and 23 to 27 Under 35 U.S.C. § 103(a)

Claims 1 to 19 and 23 to 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,660,642 ("Britten") in view of U.S. Patent No. 5,171,393 ("Moffat"). Applicants respectfully submit that claims 1 to 19 and 23 to 27 are not unpatentable for at least the following reasons.

Claim 1 relates to a fluid meniscus process. Claim 1 recites that the process includes the step of holding at least a portion of a first surface of an object with a holding fixture, such that at least a portion of a second surface of the object is exposed. Claim 1 recites that the process includes the step of injecting at least one fluid in a holding tank such that a fluid meniscus is formed. Claim 1 also recites that the process includes the step of contacting at least a portion of the second surface of the object with at least a portion of the fluid meniscus. Claim 1 recites that the process includes the step of moving the object and the fluid meniscus relative to each other, wherein the object and the fluid meniscus are capable of motion relative to each other in two or more directions. Claim 1 has been amended herein without prejudice to recite that the object and the fluid meniscus are capable of operatively contacting each other when moved relative to each other in two or more directions. Support for this amendment can be found, for example, at page 8, lines 20 to 22 of the Specification which states that "[t]he substrate 14, could be ... scanned over the fluid meniscus 16, as many times as necessary to achieve the desired results", and at page 8, line 25 to page 9, line 2 of the Specification which states that "Fig.1A-1D, illustrate schematically such motion as it progresses from right (Fig. 1A) to left (Fig. 1B, 1C), and back to the right (Fig. 1D)." Still further, the Specification states at page 9, lines 7 to 9, that "the substrate module 12 [] may ... contain[] the motors, chucks and feedthroughs necessary to achieve the previously described motions."

Claim 1 further recites that the process includes the step of removing the object after at least one contact with the fluid meniscus.

The Office Action states that:

“Britten teaches a method for wet etching a substrate by contacting the substrate with the meniscus of a liquid etchant. ... The substrate surface and the fluid meniscus are capable of motion relative to each other in two or more directions since the substrate is not fixed as shown in figure 1. Britten does not teach the use of a holding fixture for the substrate. However the use of a holding fixture for wet processing is well known in the etching art. Moffat teaches that a vacuum chuck is suitable for holding a substrate for subsequent wet processing steps (Col. 3, Lines 19-21). It would have been obvious to one of ordinary skill in the art at the time of invention to use a vacuum chuck to hold the substrate in order to facilitate wet processing as taught by Moffat. The vacuum chuck holder is interpreted by the examiner to be a “fluidic means” as broadly defined by applicant in claim 3.” Office Action at page 3.

Respectfully, the combination of Britten and Moffat does not render claim 1 unpatentable for at least the reason that the combination of Britten and Moffat does not disclose, or even suggest, all of the limitations of claim 1. Specifically, the combination of Britten and Moffat does not disclose, or even suggest, a fluid meniscus process that includes the step of moving the object and the fluid meniscus relative to each other, wherein the object and the fluid meniscus are capable of motion relative to each other in two or more directions and of operatively contacting each other when moved relative to each other in two or more directions, as recited in claim 1. As more fully set forth above, the Specification describes that, in one embodiment, the substrate 14 is scanned over the fluid meniscus 16 one or more times such as by scanning to the right, to the left, etc.

In contrast, Britten purports to describe a device and process in which a substrate is moved relative to a fluid meniscus. As an initial matter, Britten only describes that the substrate is moved relative to the fluid meniscus in a single direction. Specifically, Britten describes that “[t]he applicator assembly 8 comprises processing applicator 10 and rinse applicator 14, and is placed in close proximity to an inverted substrate surface 26 to be processed, such that the processing fluid 12 and the rinse water 16 both attach to the inverted substrate surface 26, forming menisci.” Column 3, lines 18 to 23. Britten further describes that “[t]he applicator assembly 8 is then translated relative to the substrate surface 26 such that an area

on the substrate is first contacted by the processing fluid 12 and then the rinse water 16.” Column 3, lines 23 to 26. The evaporated solvent 20 that is provided in the reservoir 18 absorbs into the thin film 36 of the rinse water 16 located on the substrate surface 26, inducing the fluid to flow back to the rinse applicator 14 via a “Marangoni flow”. See, for instance, column 3, lines 29 to 38.

Contrary to the Examiner’s contention, Britten does not even describe that the object and the fluid meniscus are capable of motion relative to each other in two or more directions and of operatively contacting each other when moved relative to each other in two or more directions. The Examiner states that “Britten does teach a fluid meniscus process that includes the step of moving the object and the fluid meniscus relative to each other, wherein the object and the fluid meniscus are capable of motion relative to each other in two or more directions [and that] since the substrate surface (6) is not fixed, the substrate is clearly capable of moving in two or more directions relative to the fluid meniscus as broadly claimed by applicant.” Office Action at page 2.

Respectfully, the Examiner is incorrect. First, there is no description whatsoever in Britten that the substrate is moved or is capable of being moved in more than one direction relative to the fluid meniscus. Thus, the Examiner’s contention that the substrate and the fluid meniscus are capable of motion relative to each other in two or more directions is not supported by Britten and impermissibly attributes to the reference features that are simply not present.

Furthermore, Britten do not disclose or suggest that the object and the fluid meniscus are capable of motion relative to each other in two or more directions and of operatively contacting each other when moved relative to each other in two or more directions because the device of Britten will not operate if the substrate and the fluid meniscus are moved in any direction other than the direction shown by the arrow in Figure 1. Specifically, only when the substrate 26 is moved in one direction, i.e., the left-pointing direction shown by the arrow in Figure 1, relative to the meniscus of the processing fluid 12 will the wetted portion of the substrate surface 26 be brought into the proximity of the drying vapors of reservoir 18. If the substrate 26 is moved in a different direction relative to the processing fluid 12, the wetted portion of the substrate surface 26 will not be brought into the proximity of the drying vapors of reservoir 18. That Britten can only be employed to move a substrate relative to a fluid meniscus a single time and in a single direction is evidenced by the

fact that, should the device of Britten be employed to move a substrate relative to a fluid meniscus more than one time and in more than one direction, the two fluids, e.g., the processing fluid 12 and the rinsing water 16, would be undesirably cross-contaminated.

Thus, even if it could be argued that Britten describes movement of a substrate relative to a fluid meniscus in two or more directions -- which for the above stated reasons it should not be -- the process described in Britten operates as described in the reference only when the substrate is moved relative to the fluid meniscus a single time and in a single direction. If moved in two or more directions, the device of Britten will not operate as intended, and thus the substrate and the fluid meniscus do not operatively contact each other when moved relative to each other in two or more directions.

Furthermore, Moffat is not relied upon to describe or suggest, and in fact does not describe or suggest, the features not described or suggested by Britten. Specifically, Moffat does not disclose, or even suggest, a fluid meniscus process that includes the step of moving the object and the fluid meniscus relative to each other, wherein the object and the fluid meniscus are capable of motion relative to each other in two or more directions, as recited in amended claim 1.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). As indicated above, nowhere does the combination of Britten and Moffat disclose, or even suggest, a fluid meniscus process that includes the step of moving the object and the fluid meniscus relative to each other, wherein the object and the fluid meniscus are capable of motion relative to each other in two or more directions and of operatively contacting

each other when moved relative to each other in two or more directions, as recited in claim 1.

Since the combination of Britten and Moffat does not disclose, or even suggest, all of the limitations of claim 1 as more fully set forth above, it is respectfully submitted that the combination of Britten and Moffat does not render obvious claim 1.

Furthermore, it is respectfully submitted that the combination of Britten and Moffat does not render obvious claims 2 to 19 and 23 to 27, which depend from claim 1 and therefore include all of the limitations of claim 1. Thus, it is respectfully submitted that claims 2 to 19 and 23 to 27 are allowable for at least the same reasons that claim 1 is allowable. In re Fine, supra (any dependent claim that depends from a non-obvious independent claim is non-obvious).

Therefore, withdrawal of this rejection, and allowance of claims 1 to 19 and 23 to 27, is respectfully requested.

III. Rejection of Claim 20 to 22 Under 35 U.S.C. § 103(a)

Claims 20 to 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Britten in view of Moffat and U.S. Patent No. 5,279,703 ("Habberger"). Applicants respectfully submit that claims 20 to 22 are not unpatentable for at least the following reasons.

The Office Action states that "Britten in view of Moffat discloses the method of invention substantially as claimed, but does not teach the use of electromagnetic radiation [but that] Habberger teaches a process for etching a substrate in which electromagnetic radiation is used to heat a substrate and improve the etch rate (Col. 4, Lines 65-68)." Office Action at page 4. The Office Action concludes that "[i]t would have been obvious to one of ordinary skill in the art at the time of invention to irradiate the substrate in the well-known manner in order to heat the substrate and improve the etch rate as indicated by Habberger (Col. 4, Lines 6-10)." Office Action at page 4.

Respectfully, the combination of Britten, Moffat and Habberger does not disclose, or even suggest, all of the limitations of amended claim 1, from which claims 20 to 22 ultimately depend. As set forth more fully above, the combination of Britten and Moffat does not disclose, or even suggest, all of the limitations of claim 1. Furthermore, Habberger is not relied upon to describe or suggest, and in fact does

not describe or suggest, the features not described or suggested by the combination of Britten and Moffat. Specifically, Habberger does not disclose, or even suggest, a fluid meniscus process that includes the step of moving the object and the fluid meniscus relative to each other, wherein the object and the fluid meniscus are capable of motion relative to each other in two or more directions and of operatively contacting each other when moved relative to each other in two or more directions, as recited in claim 1.

Since the combination of Britten, Moffat and Habberger does not disclose, or even suggest, all of the limitations of claim 1 as more fully set forth above, it is respectfully submitted that the combination of Britten, Moffat and Habberger does not render obvious claims 20 to 22, which depend from claim 1 and therefore include all of the limitations of claim 1. It is respectfully submitted that claims 20 to 22 are allowable for at least the same reasons that claim 1 is allowable. In re Fine, supra (any dependent claim that depends from a non-obvious independent claim is non-obvious). Therefore, withdrawal of this rejection, and the allowance of claims 20 to 22, is respectfully requested.

IV. Conclusion

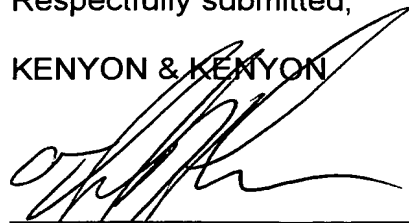
Applicants respectfully submit that all of the pending claims of the present application are now in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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